**SBI 3U**

**Unit Test: Internal Systems and Regulation**

**Part A: Multiple Choice**

Circle the most correct answer. (10 marks K+U)

1. In what order does food pass through the three sections of the small intestine?
   1. Duodenum, ileum, jejunum
   2. Jejunum, duodenum, ileum
   3. Duodenum, rectum, ileum
   4. Duodenum, jejunum, ileum
   5. It is the large intestine that is divided into three sections.
2. Ulcers are the result of
   1. Stomach acid “eating” the smooth muscle of stomach.
   2. A lack of mucous lining in stomach
   3. A bacterial infection
   4. A + C are correct
   5. All of the above
3. Which of the following statements is false?
   1. Water is reabsorbed in the small intestine
   2. Nutrients are absorbed in the small intestine
   3. The pancreas plays a role in neutralizing the gastric juices
   4. The gallbladder stores and concentrates bile
   5. All the statements are correct.
4. In the pulmonary circuit, blood travels in this order
   1. Pulmonary arteries, Left heart, lungs
   2. Right heart, pulmonary arteries, lungs
   3. Lungs, Pulmonary arteries, Left heart
   4. Lungs, Pulmonary arteries, Right heart
   5. None of the above
5. In the systemic circuit, the order of blood flow is:
   1. Lungs, left atrium, left ventricle, aorta
   2. Lungs, right atrium, right ventricle, aorta
   3. Aorta, left ventricle, right ventricle, lungs
   4. Right atrium, right ventricle, pulmonary artery, lung
   5. Left atrium. Left ventricle, pulmonary artery, lung
6. Choose the correct response
   1. All arteries carry oxygenated blood away from the heart
   2. All arteries carry deoxygenated blood to the heart
   3. All veins carry oxygenated blood to the heart
   4. All veins carry deoxygenated blood away for the heart
   5. None of the above
7. Which of the following is NOT a process involved in respiration:
   1. External respiration
   2. Breathing
   3. Cellular metabolism
   4. Internal respiration
8. Which of the following list of structures is listed in the correct order in which air passes through them during exhalation:
   1. Nasal cavities, pharynx, bronchi, bronchioles, alveolus, trachea
   2. Alveolus, bronchioles, bronchi, trachea, pharynx, naval cavities
   3. Alveolus, bronchioles, bronchi, pharynx, trachea, naval cavities
   4. Bronchioles, alveolus, bronchi pharynx, nasal cavities, trachea
9. During inspiration, what happens to the diaphragm?
   1. It relaxes and becomes dome shaped
   2. It relaxes and flattens
   3. It contracts and becomes dome shaped
   4. It contracts and flattens
10. Gases move from an area of \_\_\_\_\_\_ concentration to an area of \_\_\_\_\_\_ concentration:
    1. Equal, equal
    2. Low, high
    3. High, low
    4. None of the above

**Part B: Short Answer**

Choose 6 of the 10 questions to answer (12 marks K+U)

1. What is the role of the liver in the digestion system?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. How does digestion start prior to even swallowing our food?  
     
   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What are three enzymes found in gastric juices?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. How does food move along the intestine?  
     
   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What is the difference between atherosclerosis and arteriosclerosis?  
     
   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Describe the process of blood clotting.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What is the difference in meaning between the terms diastole and systole?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Why is oxygen so important for survival?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What is the function of the alveoli in the respiratory system?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What is bronchitis? How does it affect the respiratory system?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Part C: Long Answer**

Choose 1 of the 3 questions to answer (8 marks C)

1. You have just eaten a piece of pizza. Use a flowchart to illustrate how the pizza will be digested. Be sure to include any enzymes that are present.
2. Write a paragraph describing lifestyle choices that can promote cardiovascular health.
3. Describe, using a venn diagram or t-chart, inhalation and exhalation. Be sure to discuss the following: diaphragm movement, intercostals muscles and rib cage movement, chest volume, and pressure in lungs.

**Part D**

Choose 2 of the 6 questions to answer. One question must be from the Application (A) category and One from the Thinking/Inquiry (T) category (10 marks 🡪5 T+I, 5 A)

1. In an attempt to lose weight many people resort to using laxatives. What effect do laxatives have on the digestive system? **(T+I)**
2. Diverticulities is a common digestive disease that, in severe cases, will require a section of the intestine to be surgically removed. If a man required 40 cm of his small intestine to be removed, what might his diet consist of while his intestines heal? What might his diet consist of after the intestines heal (HINT: how will missing 40 cm of intestine affect absorption of nutrients?) **(A)**
3. Explain why the loss of regular heart rhythm may result in serious illness or even result in death **(A)**
4. Why could a very high systolic pressure be dangerous? **(T/I)**

.

1. Based on the information presented in this unit, describe the potential dangers associated with cigarette smoking on the respiratory system. Be sure to discuss nicotine’s impacts on the cilia, the blood vessels, and blood pressure. What problems would be caused for the cells of the body? **(A)**
2. a) Why is it a good idea to wear a breathing mask when doing carpentry or working in a

dusty area?

b) What are two other situations in which it would be a good idea to wear a breathing

mask?

**SBI 3U**

**Unit Test Answer Key : Internal Systems and Regulation**

**Part A: Multiple Choice**

Circle the most correct answer. (10 marks K+U)

1. In what order does food pass through the three sections of the small intestine?
   1. Duodenum, ileum, jejunum
   2. Jejunum, duodenum, ileum
   3. Duodenum, rectum, ileum
   4. Duodenum, jejunum, ileum
   5. It is the large intestine that is divided into three sections.
2. Ulcers are the result of
   1. Stomach acid “eating” the smooth muscle of stomach.
   2. A lack of mucous lining in stomach
   3. A bacterial infection
   4. A + C are correct
   5. All of the above
3. Which of the following statements is false?
   1. Water is reabsorbed in the small intestine
   2. Nutrients are absorbed in the small intestine
   3. The pancreas plays a role in neutralizing the gastric juices
   4. The gallbladder stores and concentrates bile
   5. All the statements are correct.
4. In the pulmonary circuit, blood travels in this order
   1. Pulmonary arteries, Left heart, lungs
   2. Right heart, pulmonary arteries, lungs
   3. Lungs, Pulmonary arteries, Left heart
   4. Lungs, Pulmonary arteries, Right heart
   5. None of the above
5. In the systemic circuit, the order of blood flow is:
   1. Lungs, left atrium, left ventricle, aorta
   2. Lungs, right atrium, right ventricle, aorta
   3. Aorta, left ventricle, right ventricle, lungs
   4. Right atrium, right ventricle, pulmonary artery, lung
   5. Left atrium. Left ventricle, pulmonary artery, lung
6. Choose the correct response
   1. All arteries carry oxygenated blood away from the heart
   2. All arteries carry deoxygenated blood to the heart
   3. All veins carry oxygenated blood to the heart
   4. All veins carry deoxygenated blood away for the heart
   5. None of the above
7. Which of the following is NOT a process involved in respiration:
   1. External respiration
   2. Breathing
   3. Cellular metabolism
   4. Internal respiration
8. Which of the following list of structures is listed in the correct order in which air passes through them during exhalation:
   1. Nasal cavities, pharynx, bronchi, bronchioles, alveolus, trachea
   2. Alveolus, bronchioles, bronchi, trachea, pharynx, naval cavities
   3. Alveolus, bronchioles, bronchi, pharynx, trachea, naval cavities
   4. Bronchioles, alveolus, bronchi pharynx, nasal cavities, trachea
9. During inspiration, what happens to the diaphragm?
   1. It relaxes and becomes dome shaped
   2. It relaxes and flattens
   3. It contracts and becomes dome shaped
   4. It contracts and flattens
10. Gases move from an area of \_\_\_\_\_\_ concentration to an area of \_\_\_\_\_\_ concentration:
    1. Equal, equal
    2. Low, high
    3. High, low
    4. None of the above

**Part B: Short Answer**

Choose 6 of the 10 questions to answer (12 marks K+U)

1. What is the role of the liver in the digestion system?

The liver has two roles in digestion. The liver makes bile which is essential in breaking down fats in the small intestine. The liver processes the nutrients delivered by from the small intestine depending on the body’s current needs.

1. How does digestion start prior to even swallowing our food?

When we see or smell food our mouths start to water, this saliva contains amylase which will help break down starches in our mouths. Also at the sight of food our brains send signals to the digestive enzymes to start releasing enzymes needed to break down food.

1. What are three enzymes found in gastric juices?

Pepsin, trypsin, and pancreatin enzyme are three enzymes present in the stomach’s gastric juice.

1. How does food move along the intestine?

Food moves along the intestine by peristalsis. Peristalsis is a wave-like movement by the muscles to push the intestine’s contents forward.

1. What is the difference between atherosclerosis and arteriosclerosis?

Atherosclerosis = Narrowing of arteries due to plaque build-up in artery wall. As pathway narrows blood pressure increases.

Arteriosclerosis= Advanced case of plaque buildup where the artery hardens. Arteries loose ability to stretch. There is a chance of blood clots forming in the blood vessel.

1. Describe the process of blood clotting

Blood clotting begins when platelets stick to the site where the blood vessel is damaged. The platelets then release clotting factors. These clotting factors make other platelets sticky and active, resulting in reactions that form a protein called fibrin. Fibrin threads trap red blood cells and platelets, eventually forming a patch that covers the break in the wall.

1. What is the difference in meaning between the terms diastole and systole?

Systole is the highest recorded pressure in the artery, when the ventricles contract. Diastole is the lowest recorded pressure in the artery, during the relaxation phase of the artery.

1. Why is oxygen so important for survival?

Oxygen is so essential for survival because cells obtain energy through a chemical reaction called oxidation. Life processes in humans cannot be maintained without an adequate supply of oxygen. Even a few minutes without oxygen for humans could result in death.

1. What is the function of the alveoli in the respiratory system?

The alveoli are tiny sacs present in the lungs that allow the exchange of gases between the atmosphere and the blood to occur based on concentration gradients. Oxygen and carbon dioxide will move from areas of higher concentration to areas of lower concentration. Thus, oxygen moves from the lungs to the alveoli and carbon dioxide moves from the alveoli into the air inside the lung.

1. What is bronchitis? How does it affect the respiratory system?

Bronchitis is an infection of the bronchioles. When this happens, they swell and produce excess mucous. This causes frequent coughing and difficulty breathing. The heart must also work harder to transport an adequate amount of oxygen through the body.

**Part C: Long Answer**

Choose 1 of the 3 questions to answer (8 marks C)

1. You have just eaten a piece of pizza. Use a flowchart to illustrate how the pizza will be digested. Be sure to include any enzymes that are present.

See pizza 🡪 mouth waters releasing amylase 🡪 amylase starts to breakdown starch and teeth breaks down food into smaller pieces 🡪 food travels down esophagus to the stomach🡪 muscles in stomach break down food mechanically 🡪 acidic gastric juices, containing enzymes such as pepsin, trypsin, and pancreatin enzyme digest food 🡪 the digested food is now called chyme and is released in small amounts into the duodenum🡪 gastric juice neutralized by sodium bicarbonate secreted by the pancreas 🡪 pancreas releases the digestive enzymes trypsinogen, phospholipase, carboxypeptidase into the duodenum 🡪 gallbladder releases bile (which was made in the liver) to help the digestion and absorption of fats 🡪 food moves from duodenum to jejunum by peristalsis 🡪 nutrients absorbed from jejunum and ileum 🡪 nutrients travel by blood to liver where they are processed 🡪 chyme travels to large intestine 🡪 water reabsorbed in large intestine 🡪 feces excreted through anus

1. Write a paragraph describing lifestyle choices that can promote cardiovascular health.

Cardiovascular health can be promoted by healthier eating habits. Good choices for the heart include foods low in cholesterol and salt. Low density lipoproteins or “bad cholesterol” can become part of the plaque in arteries. LDL can be avoided by avoiding foods that are high in saturated or trans-fat such as beef, butter, cheese, ice-cream, margarine and deep-fried foods. It is important to check the label in the foods that are purchased. Maintaining a healthy weight and regular exercise also reduces heart straining conditions such as high blood pressure, cholesterol and diabetes. By avoiding smoking we can also be helping maintain good cardiovascular health by avoiding narrowing of blood vessels, increased heart rate and blood pressure as a result of Nicotine. Regular health checkups are important so that we can get out blood pressure, heart sounds and pulse rate checked by health practitioners.

1. Describe, using a venn diagram or t-chart, inhalation and exhalation. Be sure to discuss the following: diaphragm movement, intercostals muscles and rib cage movement, chest volume, and pressure in lungs.

Possible Answer Using T-Chart:

|  |  |  |
| --- | --- | --- |
|  | **Inhalation** | **Exhalation** |
| Diaphragm Movement | -diaphragm flattens and pulls downward | -diaphragm relaxes and becomes dome-shaped |
| Intercostal Muscle and Rib Cage Movement | -intercostal muscles contract  -rib cage pulls up and outward | -intercostal muscles relax  -rib cage falls |
| Chest Volume | -chest volume increases | -chest volume decreases |
| Pressure in Lungs | -pressure in lungs decreases | -pressure in lungs increases |

**Part D:**

Choose 2 of the 6 questions to answer. One question must be from the Application (A) category and One from the Thinking/Inquiry (T) category (10 marks 🡪5 T+I, 5 A)

1. In an attempt to lose weight many people resort to using laxatives. What effect do laxatives have on the digestive system? **(T+I)**

Laxatives decrease the transit time of the digestive system, meaning food spends less time in the body. A decreased transit time will primarily affect the processes that occur in the small and large intestine. In the small intestine food will move through quickly meaning that nutrients will be not absorbed. Long term effects of this would be nutrient deficiencies and weight loss. Proper water reabsorption will not occur in the large intestine, which is why laxatives cause diarrhea. Poor water reabsorption will rapidly lead to dehydration.

1. Diverticulities is a common digestive disease that, in severe cases, will require a section of the intestine to be surgically removed. If a man required 40 cm of his small intestine to be removed, what might his diet consist of while his intestines heal? What might his diet consist of after the intestines heal (HINT: how will missing 40 cm of intestine affect absorption of nutrients?) **(A)**

Immediately after surgery the man will have to get his nutrients intravenously since his intestines will not be able to manage the passage of food. After a day or two the man will be able to eat foods that are easy to digest, so foods that are low in fibre, because though fibre is usually good for you it also increases the workload of the intestines which should be avoided so soon after surgery. Once the intestines completely heal the man should be eating a diet that is high in fibre, which will prevent constipation and keep his intestine clean. Also he will need to be eating high nutrient foods since his system has become less efficient at absorbing nutrients. He will probably also need to supplement his diet with daily vitamins.

1. Explain why the loss of regular heart rhythm may result in serious illness or even result in death **(A)**

With a loss of regular heart beat the heart is either beating too fast or too slow. Irregular heart beat can occur due to improper electrical impulses, thus the heart is already damaged. A drop in blood supply can change the ability of heart cells and heart tissue to send electrical impulses. Due to genetic factors or unhealthy lifestyle habits the heart may be damaged or have some dead tissue. With this irregular beat less oxygen is being pumped to the body. Individuals as a result, may feel dizzy, lightheaded and fatigued. When the heart is not beating properly, blood is not being pumped properly this can cause blood to collect in pools and form clots. If a clot is dislodges it can move to the brain and cause a stroke. Strokes can cause brain damage and this can be fatal. If an irregular beat is untreated and prolonged, it can result in a lack of sufficient blood supply to the organs and can result in heart failure.

1. Why could a very high systolic pressure be dangerous? **(T/I)**

Blood pressure depends of 2 factors: Cardiac output and resistance of arteries. If more blood is pumped through an artery the pressure of the blood would also increase. If arteries do not expand then blood pressure on the arterial walls increases. A large increase in pressure on the artery walls can damage these walls. Tears may occur in the artery walls; these tears can speed up atherosclerosis and lead to an even great increase in blood pressure. Systolic pressure is the pressure it takes to pump blood to the entire body. High systolic pressure means the left ventricle of the heart is working too hard to pump. With working so hard, over time the heart muscle expands and the muscles become weak and can no longer push blood through the body. When the heart overworks it can lead to a heart attack or congestive heart failure.

.

1. Based on the information presented in this unit, describe the potential dangers associated with cigarette smoking on the respiratory system. Be sure to discuss nicotine’s impacts on the cilia, the blood vessels, and blood pressure. What problems would be caused for the cells of the body? **(A)**

Nicotine causes the destruction of many of the cilia that line the bronchi and bronchioles. Since the cilia work to prevent foreign particles from entering the nasal cavities, more debris will enter the respiratory system. When the cilia aren’t able to work properly, coughing may result as the body attempts to rid the foreign debris. Nicotine also causes a buildup of mucous along the walls of the bronchioles. This reduces the interior diameter of the tubes. This may cause a person to cough more frequently and have difficulty breathing. There is also an increase in blood pressure that causes the rupturing of the walls of some of the alveoli. If the alveoli rupture, inadequate transfer of gases may occur. As a result, the person’s cells may not receive the adequate amount of oxygen required to function optimally.

Thus, it is evident that there are many negative effects of cigarette smoking on the respiratory system.

1. a) Why is it a good idea to wear a breathing mask when doing carpentry or working in a

dusty area?

It is a good idea to wear a breathing mask when doing carpentry or working in a dusty area to prevent excessive inhalation of debris. Too much debris can overwork the cilia. Since the cilia work to prevent foreign particles from entering the nasal cavities, more debris will enter the respiratory system. When the cilia aren’t able to work properly, coughing may result as the body attempts to rid the foreign debris.

b) What are two other situations in which it would be a good idea to wear a breathing

mask?

A situation where it would be a good idea to wear a breathing mask would be if you were a surgeon/nurse. Surgeons must wear breathing masks to ensure that the area in which they work is sanitized. Since they may be working with open wounds, they wouldn’t want to spread any germs from their mouth to the patient.

Another situation in which it would be a good idea to wear a breathing mask would be if you were working with toxic chemicals (e.g. painters, welders). You wouldn’t want to inhale such substances – they may have negative impacts not only on the respiratory system, but on other systems such as the brain.

***References:***

Sandner, Lionel, Clayton Ellis et al. *Investigating Science BiologySource 11*. 2011 ed.

Toronto: Pearson Education Canada, 2011. Print.

Ritter, B., Adam-Carr, C., Fraser, D.  *Biology 11.*  2002.  Toronto:  Thomson Canada

Limited.